Federal Democratic Republic of Ethiopia

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ET 477 (2000) (English): SEEDS - VERFICATION SPECIES AND CULTIVARS

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ETHIOPIAN
STANDARD

ES 477:2000

(Reaffirmed :2012)

First edition

Seed –Verification of species and cultivars

ICS: 65.020.20

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Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for seeds (TC 16) and published by the Ethiopian Standards Agency (ESA).
The technical contents in the text of this Standard are identical with ES 477:2000 edition while the reissued standard carries some editorial and technical changes observed in the course of systematic review.

Acknowledgement has been made for the use of the indicated publication.
All Ethiopian Standards whether they are adoption of International Standard such as the ASTM ISO and IEC or not, are subject to copy right protection.

Seed — Verification of species and cultivars

1 Scope

This Ethiopian Standard specifies the method for determining the extent to which the submitted seed sample shall conform to the species or cultivar claimed for it.

2 Normative references

The following standard contain provision which, through reference in this text, constitute provision of this Ethiopian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian Standards indicated below. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES 471:2000, *Seed – Sampling.*

ES 474:2000*, Seed – Germination test.*

3 Field of application

The determination shall be valid only if the sender states the species or cultivar of the sample and if an authentic standard sample of the species or cultivar is available for comparison. The characters compared may be morphological, physiological, cytological or chemical.

4 Principles

The determination is carried out, depending on the species or cultivar in question, on:

4.1 Seeds, Seedlings, or more mature plants grown in a laboratory, greenhouse, lathhouse, or field plots.

4.1.1 Normally, seeds compared with seeds from the authentic sample and seedlings and plants are compared with seedlings and plants at the same stage of development grown from the authentic sample contemporaneously, near-by and in identical environmental conditions. Exceptionally, depending on the certainty of the determination (e.g. ploidy) comparison with the authentic control sample is not obligatory.

4.1.2 In the case of species or cultivars that are sufficiently uniform as to one or more diagonistic characters (e.g. in self-pollinated species), a count is made of the number of seeds, seedlings or plants that are not genuine. If the species or cultivar shall not be sufficiently uniform (e.g. in cross-pollinated species) a count is made of any obvious off-types and a general judgment is expressed as to the genuineness of the sample under test.

5 Sampling

Samples shall be taken in accordance with ES 471. .

6 Apparatus and facilities

6.1 In the laboratory the following appropriate apparatus and reagents for morphological, physiological and cytological examinations, chemical tests and germination of seeds shall be available.

6.1.1 Apparatus

a) Petri dish;
b) Filter paper;
c) Glass plate;
d) Magnifying glass;
e) Source of ultra - violet light; and
f) Damp sand.

6.1.2 Reagents

During the test, use only reagents of recognized analytical grade and distilled water

a) Phenol;

b) lugol's solution;

c) NaCl or HCl; and

d) Alcohol.

6.2 Green house: provision of controlled environmental conditions adequate to induce the development of diagnostic characters shall be available.

6.3 Field Plots Climatic edaphic and cultural conditions are necessary for permitting normal development of the diagnostic characters of seeds as well as sufficient protection against pests and diseases shall be availed.

7 Weight of submitted samples

Table 1 – The minimum weights of samples submitted

Ser. No.	Different species and cultivars	Laboratory only (g)	Field plot & laboratory (g)
1	Pisum, phaseolus, Vicia, Lupinus, Glycine, and species of other genera with seeds of similar size	1,000	2,000
2	Hordeum Avena, Triticum, Secale, and species of other genera with seeds of similar size	500	1,000
3	Beta and species of other genera with seeds of similar size	250	500
4	All other genera	100	250

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8 Examination of seeds

8.1 Working sample

Seeds not less than 400 seeds, taken at randon from a sub-sample drawn in accordance with FDES4093 there in. The seeds shall be tested in replicates of not more than 100 seeds.

8.2 Determination

8.2.1 For morphologtical characters, the seeds shall be examined with the aid of suitable magnifying apparatus when necessary.

8.2.2 For color characters, the seeds may be examined under full day light or light of limited spectrum e.g. ultra-violet.

8.2.3 For chemical characteristics, the seeds shall be treated with the appropriate reagent and the reaction of each seed noted.

9 Examination of seedlings

9.1 Working sample

Seeds not less than 400 (or for ploidy initially 100 with a further 100 when the initial determination is in conclusive taken at randon from a sub-sample drawn in ES 471.

9.2 Determination

The seeds shall be germinated in replicates not more than 100, on an appropriate medium. When the seedlings have reached a suitable stage of development they shall be examined in whole or in part, with or without further treatment. For a determination of ploidy, root tip or other tissue shall be excised and processed for microscopic examination.

10 Examination of plants in greenhouse or lathouse

10.1 Working sample

Sufficient seeds to produce not less than 100 plants may be used, but this number may be reduced in the case of climbing or creeping species. The seeds shall be taken at random from a sub-sample drawn in accordance with ES 471.

10.2 Determination

The seeds shall be sown in suitable containers and maintained in the environmental conditions necessary for the development of diagnostic characters. When the plants have reached a suitable stage of development, the critical characters shall be observed on each plant and noted.

11 Examination of plants in field plots

The submitted sample shall be sown (in whole or in part) as soon as practicable after receipt. Each sample shall be sown in at least two replicate plots. As insurance against failure the replicate should be situated in different fields or different parts of the same field. The plots may be of any convenient size that will provide enough plants for the determination to be of the accuracy required. If the seed is sown in situ, it shall be sown in rows, mechanically if possible. Spacing between rows and between plants shall be sufficient to allow development of the character to be examined. Both transplanting and thinning are possible sources of error and the sowing rate shall be adjusted to produce approximately the same number of plants in the test and control plots. When absolutely necessary, thinning or transplanting of seedlings from elsewhere in the plot is permissible.

Observation shall be made during the whole growing period and deviations from the control sample recorded. Plants recognisable as belonging to another cultivar or species or as aberrants (e.g. fatuoid oats, speltoid wheats) shall be counted and recorded.

When practicable, either an actual count or an estimate of the number of plants in the plot shall be made preferably at the time the plants are examined.

12 Expression of result

When not more than 2,000 seeds, seedlings or plants are examined, the number found to be not genuine shall be computed as a percentage with out decimals. If more than 2,000 are examined, the number shall be computed as a percentage to one decimal place.

12.1 Seeds and seedlings

In determination of seedlings, the results are expressed as percentages of the number of normal seedlings (as defined in ES 474.

12.2 Plot examination

12.2.1 Whenever possible, the number of plants found to be of other cultivars, other species or aberrant shall be expressed as a percentage of the number of plants examined.

12.2.2 In the case of herbage plants and similar species when grown in rows without wide spacing, it shall be difficult to estimate the total number of plants examined per plot and the result shall be expressed as the number of divergent plants produced by the weight of seed sown.

12.2.3 When characters are measured, the mean and other statistics shall be calculated.

12.2.4 Cultivars of cross-fertilizing species such as root rye crops, herbage plants, etc. shall often show variability of plant characteristics to such a degree that it shall be difficult to define accurately all off- types; in such cases, any calculations of percentage impurities shall be supplemented by appropriate comments about the genuineness of the test sample.

13 Test report

The test report includes the following information:

a) For laboratory, greenhouse or lathouse tests the number of seeds, seedlings or plants examined shall be stated.

b) The result of an examination of seeds or seedlings shall be reported as the percentage of extraneous seeds or seedlings. If non-is found, the result shall be reported on the analysis certificate as “the laboratory (or greenhouse) examination for genuineness revealed nothing to indicate that the species and cultivar stated by the sender are incorrect”.

c) In the case of a fluorescence that of Lolium, the results shall be reported as follows:

Of..........seeds producing normal seedlings, ...% react positively and ....% react negatively to ultra-violet light.

d) The result of a field plot examination shall, whenever possible, be reported as a percentage of each other species, other cultivar or aberrant found. If a sample is found to be of a cultivar other than that stated by the sender, this result shall be reported. If the proportion of plants of other cultivars present in a sample exceeds 15%, the report shall state additionally that, “The sample consists of a mixture of different cultivars”.

e) When the result is not possible to be expressed as a percentage appropriate comments regarding the genuineness of the sample shall be reported. If nothing worthy of special comment was found, it is required to state on the analysis certificate as, “the results of a field plot examination of this sample revealed nothing to indicate that the cultivar (or species) name stated by the sender is incorrect”

f) If, exceptionally, an authentic control sample has not been tested for comparison, this shall be stated.

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Ethiopian Standards Agency

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Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement
ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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